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Purification of Solid Waste from drainage

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Abstract:

Wastewater is characterized as the stream of utilized water from homes, organizations, ventures, business exercises and foundations which are subjected to the treatment plants by a precisely planned and built system of funnels. There are no occasions for wastewater treatment, and most plants work 24 hours each day of the week. Wastewater treatment plants take a shot at basic purpose of the water cycle, helping nature shields water from the intemperate contamination. But the abundant amount of undesirables in the waste water such as solid wastes and other form of materials that do not form the waste water treatment can overwhelm the system at times due to rainfall and natural forces. In order to remove a certain amount of solid waste and undesirables from the waste water we use the automatic gutter cleaning machine which is intended to as a check point at various focus points where the waste get accumulated. Thus it reduces the work done by the treatment plan and facilitates smooth flow of waste water system.

I. INTRODUCTION

Cleaning of drains/gutters has always been a problem. Labors cleaning gutters & drain seems unethical and also leads to a high risk of them catching infections or poisoning due to large amounts of waste/chemicals in them. Also throwing of bottles/plastics and other such objects into the gutters lead to narrowing and eventually blockage in gutter flow. This leads to overflow in many cases. So here we provide a fully automated drain gutter cleaning mechanism to tackle these modern day gutter jamming issues. Our system uses an automated gutter/drain cleaning system that lets fluids flow through it but catches large solid waste like bottles & plastic and accumulates it. So gutter cleaners need to just clean these gutter cleaning systems installed at points instead of cleaning entire gutter floors. Our system consists of metal teeth based jaws that wait at the bottom of the mechanism This project automatically cleans the water in the drainage system randomly and removes waste and this form an efficient and easy way of cleaning the drainage system and preventing the blockage. It also reduces labor and improves the quality of water that is cleaned. If the garbage are allowed to flow they will end up flowing down to recreational beaches used for tourism purposes making a scene not pleasurable to the eyes else these garbage flow to residential sites where they are burnt in a way of getting rid of them, thereby causing climate change. Here we provide a fully automated drain gutter cleaning mechanism to tackle these modern day gutter jamming issues. This proposed system uses an automated gutter (or) drain cleaning system that lets fluids flow through it but catches large solid waste like bottles, plastic and accumulates it. So, gutter cleaners need to just clean these gutter cleaning systems installed at points instead of cleaning entire gutter floors. The problem such as Environmental pollution and spreading of viral diseases are avoidable. Automation of Drainage Cleaning System would reduce the risk of various diseases spread due to accumulation of waste. The devices are place across drain so that only water flow through lower grids, waste like bottle, etc. Floating in drain is lifted by a tooth which is connected to chain. This chain is attached by sprockets driven by motor. When motor runs the chain starts to circulate making teeth to lift up. The waste materials are lifted by teeth and are stored in waste storage tank.

II. WORKING PRINCIPLE

The device is placed across drain so that only water flow through the lower grids, waste like bottles etc… Floating waste in the drain is lifted by the teeth which are connected to chain. This chain is attached with gear driven by motor. When motor runs the chain starts to circulate making teeth to lift up. The waste material are lifted by teeth and accumulated in the storage tank. Finger shaped clasp(lifting teeth) is attached to the chain which is used to pick up the solid waste from drain and carries it and throws it away in waste bucket attached at backside of drainage system model. This process continues automatically by the help of motor in current supply in order to avoid blockage of drains and enhance sewage treatment system.

III. SELECTION OF MATERIALS

The various factors determining the choice of materials are discussed below.

A. Properties:

The materials selected must possess the necessary properties for the proposed application. The

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various requirements to be satisfied can be weight, surface finish, rigidity, ability to withstand environmental attacks from chemicals, service life, reliability etc.

The following four types of principle properties of materials decisively affect their selection:

a. Physical
b. Mechanical
c. From Manufacturing Point Of View
d. Chemical

The various physical properties concerned are melting point, thermal conductivity, specific heat, coefficient of thermal expansion, specific gravity, electrical conductivity, magnetic purposes etc.

The various mechanical properties concerned are strength in tensile compressive shear, bending, tensional and buckling load, fatigue resistance, impact resistance, elastic limit, endurance limit, and modulus of elasticity, hardness, wear resistance and sliding properties.

The various properties concerned from the manufacturing point of view are,

a. Cast Ability
b. Weld Ability
c. Forge Ability
d. Surface Properties
e. Shrinkage
f. Deep Drawing

B. Manufacturing Case:

Sometimes the demand for lowest possible manufacturing cost or surface qualities obtainable by the available application of to manufacture the desired component may not yield the best result and we are forced for other options.

C. Quality Required:

This generally affects the manufacturing process and ultimately the material. For example, it would never be desirable to go casting of a less number of components which can be fabricated much more economically by welding or hand forging the steel.

D. Availability of Materials:

Some materials may be scarce or in short supply. It then becomes obligatory for the designer to use some other material which though may not be a perfect substitute for the material designed. The delivery of materials and the delivery date of product should also be kept in mind.

E. Space Consideration:

Sometimes high strength materials have to be selected because the forces involved are high and space limitations are there.

F. Cost:

As in any other problem, in selection of materials, the cost of material plays an important part and should not be ignored.

Sometimes factors like scrap utilization, appearance, and non-maintenance of the designed part are involved in the selection of proper materials.

IV. RESULTS AND DISCUSSIONS

Drainage Cleaning System is a social incentive project where we tried to present a much better procedure to keep our drain clean and thus providing the way to a cleaner and safer surrounding. We performed the following test and results are being discussed as follows:

- Weight Lifted We tried to present the model where the model is successfully able to lift the 15 Kg
- Speed of the Drain As the setup which performs excellently on the constraints condition that have been designed in view of the real life drain condition, we try to provide the drain with the minimum speed of 30-50rpm
- Time taken by each lifter to lift each object from bottom to top is 11.46 sec
- Quantity of waste collecting in the collecting bin is nearly 8-9 kilogram

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V. SCOPE OF THE PROJECT

As the project has been based on the concept, to integrate the benefits for human health, societal concerns and national cleanliness policy. Therefore it covers many sections of proportionate benefits to the all sphere of our present life.

A. FOR ACADEMICS

- Drainage Cleaning System is basically an agglomeration of the basic mechanical components that we have gone through regressively during out past four year of curriculum. All the basic components that majorly consist of the Chain drives, Bearings, Welding, Turbine etc components are finely integrated to build to structurally simple project.
- Moreover the last add on the project to give and edge effect harnessing of the flow energy of the drain gives the project the much needed future scope of exploitation of the renewable resource.

B. FOR INDUSTRY

- Presently as a nation, India purposefully focus on two major things. Firstly as young and fast growing nation we are concentrating to pull out the maximum from our manufacturing sector with a touch of Start-ups as thing of sub-topic focus. Our Project, as being new in the market network will provide the entrepreneurs the much needed ideas to blend the technology with societal benefits and harness the market.
- Secondly, as a nation we are focusing on the Public benefits in the policy making and providing the young generation the employment and environment safety. While being a high-market potential project conserves the profit for the industry section with the advance of providing the corporate social benefits.

C. FOR SOCIETY

- In a modern society where luxury has become a necessity in the urban and rural hub, there lies a section of the population who still lives on meager just enough to satisfy its hand to mouth needs. Sanitations is one of the very basic amenities required for the basic living of a man and providing with such a technological and economical instrument which can change the pathetic sewerage condition of the town and cities of mediocre India.
- With such a potential instrument of employment generation in the society through industry co-operation, these products land you in the win-situation for the people.

VI. CONCLUSIONS

In the treatment system of drainage Waste water control by the motor, roller chain and sprocket, lifter and the collecting bin to achieve semi-automatic control of sewage waste water treatment. Drainage from industries is treated through this project to meet the national emission standards, with stable operation, low cost and good effect. Drainage wastewater control is treated by this method to irrigate plants, clean toilets, etc. The cleaner functioned effectively during the heavier rains which had more volume of running water with garbage and high velocity. By this proposed system, the men power will be reduced.

On the basis of these result we can conclude that it is an innovative method of minimizing manual stress and thus very much reliably stabilizing the in the pond. The project carried out by us made an impressing task in the environmental purpose and it is very useful for the small scale works. Although this system able to collect the garbage from the lake with human intervention. The objective of the project was successfully achieved.

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